RINGKASAN

Monosodium glutamate (MSG) adalah bubuk kristal berwarna putih yang sejak lama digunakan sebagai bahan aditif pada beragam jenis makanan di berbagai negara. Efek MSG terhadap kesehatan masih menjadi kontroversi karena banyak penelitian menyajikan data bahwa MSG menimbulkan gangguan pada berbagai sel dan jaringan sementara peneliti lain menyatakan bahwa MSG aman bagi manusia. Penelitian ini bertujuan untuk mengetahui efek pemberian MSG selama masa kebuntingan mencit terhadap perkembangan morfologi embrio, fetus dan neonatus.

Penelitian ini dilaksanakan dengan metode eskperimental menggunakan rancangan acak lengkap pola faktorial. Faktor pertama adalah dosis MSG yaitu 0; 1,25 ; 2,5 dan 5 mg/gBB dan faktor kedua adalah stadium perkembangan 8 *dpc* (*day post coitus*), 14 *dpc* dan hari pertama post-natal; dengan demikian terdapat 12 kombinasi perlakuan dan setiap kombinasi perlakuan diulang sebanyak 3 kali. Variabel penelitian berupa perkembangan morfologi embrio dengan parameter panjang *crown to rump*, berat tubuh dan bentuk vesikula otak; perkembangan morfologi fetus dengan parameter panjang *crown to rump*, berat tubuh, kenormalan membra depan dan belakang, tahapan perkembangan membra; perkembangan morfologi neonatus dengan parameter panjang *crown to rump*, berat tubuh, bentuk kaki, jumlah jari, ukuran segmen stylopod (bagian yang mengandung tulang humerus) dan segmen zygopod-autopod (bagian yang mengandung tulang radius dan ulna). Data diambil pada 8 *dpc*, 14 *dpc* dan pertama post natal. Data kuantitatif berupa panjang *crown to rump* embrio, fetus dan neonatus; berat tubuh embrio, fetus dan neonatus diuji normalitasnya dan homogenitasnya, dilanjutkan dengan uji Anova satu arah dan uji lanjut Post Hoc Tukey (HSD) menggunakan SPSS versi 23. Data kualitatif berupa kenormalan morfologi vesikula otak embrio, kaki fetus dan neonatus dianalisis secara deskriptif.

Hasil penelitian menunjukkan bahwa pemberian MSG pada induk mencit bunting memperlambat pertumbuhan berdasarkan panjang *crown to rump* dan berat embrio ($p<0,01$), perlambatan fetus 14 *dpc* dan neonatus tidak terpengaruh oleh MSG ($p>0,05$). Pemberian MSG juga berefek memperlambat perkembangan vesikula otak pada embrio 8 *dpc*, perkembangan segmen autopod pada fetus 14 *dpc* dan menurunkan ukuran segmen zygopod-autopod pada neonatus secara signifikan lebih pendek dibanding kontrol ($p<0,05$) serta menurunkan jumlah anak ($p<0,01$).

Kata kunci: MSG, embrio, fetus, neonates mencit, perkembangan membra.

SUMMARY

Monosodium glutamate (MSG) is a white crystal commonly used as flavor enhancer in various foods in many countries. The effect of MSG on human health is still controversy. Some researchers claimed that MSG is save to be consumed but other researchers showed evidences of MSG negative effects on various tissues and cells. This study was conducted to evaluate the effects of MSG administration on gravid mice throughout pregnancy period on morphological development of embryos, fetuses and neonates.

An experimental approach was applied in this study based on Factorial Completely Randomized Design. The first factor was the doses of MSG consisted of 0, 1.25, 2.50, and 5.00 mg/g BW, and the second factor was developmental stadia consisted of 8 dpc embryos, 14 dpc fetuses and neonates. Three replicates were provided for each treatment combination. The research variables were morphology of embryos with parameters of crown to rump (CR) length, body weight and brain vesicle morphology; morphology of fetuses with parameters of CR length, body weight and limb development based on fore limb and hind limb normality; neonates morphology with parameters of CR length, body weight, limb shape, digits numbers and length of stylopod as well as zygopod-autopod. The quantitative data were tested to their normality and homogeneities. The homogenous and normally distributed data were analyzed using two ways Anova followed by Tukey Post hoc using SPSS version 23. The qualitative data were describe and compared to standard mouse development chart.

The results showed that administration of MSG to the gravid mice resulted in delay of embryonic growth as indicated by reduce in CR length and body weight of embryo. Growth delay was recovered during fetal development as indicated by insignificantly different in fetuses and neonates CR length and body weight between control and treated groups ($p>0.05$). MSG administration delayed brain vesicle development of embryos and autopod development of fetal fore limb and hind limb, and reduced zygopod-autopod length of the neonates ($p<0.5$). MSG administration to the gravid mice also reduced litters number ($p<0.01$).

Key Words: MSG, mouse embryo, fetus, neonates, limb development